



CALIFORNIA STATE SCIENCE FAIR 2008 PROJECT SUMMARY

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Project Title R U a Scaredy Cat? A Scientific Study of Fear	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals The recent wildfires in Southern California generated a lot of fear in everyone. The purpose of this experiment was to understand the nature of physiological (external) responses resulting from a fearful situation and to correlate such expressions of fear to the internal processing that must occur within the body during such an event. I hypothesized that the brain and nervous system were particularly involved in processing fear.</p> <p>Methods/Materials This was a three-part experiment. Part 1: Informed consent was obtained from human subjects participating in the activity and questionnaires were developed. The fear activities on display at the California Science Center in Los Angeles were used to quantify fear through changes in pulse rate, blood pressure and sweat. A BP monitor and skin conductance apparatus were used to collect data. Questionnaires were filled out in between activities. Part 2: An Anonymous survey was carried out with 20 participants for qualitative data regarding common fearful situations and popular calming techniques. Part 3: Interviews with 3 doctors (incl. specialists), and a researcher in this area provided necessary data wrt internal body processing of fearful situation.</p> <p>Results From Part 1, clear indication of impact. Average increase in BP: 8-15 mmHg of diastolic and systolic pressure respectively, pulse rate increased by 16 beats/min, and 70% of subjects showed higher moisture level. Interesting observation: when subjects were informed of activities, blood pressure and pulse shot up. When subjects experienced activities, fear levels stabilized because the some activities weren't very scary. After the falling activity, fear levels shot up again because that was the activity most feared. In Part 2, I discovered that most people are scared of robbery. Mostly deep breaths help calm fear. Part 3 shed light on the details of fear acquisition, consolidation and expression within the amygdala of the brain. There are 2 pathways of fear: the short route produces an immediate but instinctive response. The longer route is slower but more accurate. It sends out response to activate the body's defenses.</p> <p>Conclusions/Discussion The Amygdala in the brain acquires, consolidates, and expresses fear. The Hypothalamus triggers the body's defense. Together they are responsible for internal processing of fear and activating external response. Research also indicates similar behaviors in animals.</p>	
Summary Statement A scientific study of FEAR - Using quantitative and qualitative data gathered from activities, surveys and interviews to correlate body's internal processing of fear situation to external defense response.	
Help Received Used California Science Center exhibit for Part 1 experiment; human subjects helped by participating in activities and surveys; Dr. Pant, Dr. Mandyam, Dr. Sastry and Dr. Patel shared expertise via interviews; parents provided transportation and BP monitor.	